Department of Energy

Ohio Field Office
Fernald Closure Project
175 Tri-County Parkway
Springdale, Ohio 45246
(513) 648-3155

DEC 6 2004

DOE-0074-05

Mr. James A. Saric, Remedial Project Manager
United States Environmental Protection Agency
Region V, SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

TRANSMITTAL OF RESPONSES TO THE OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE 2003 SITE ENVIRONMENTAL REPORT COMMENT RESPONSES

Reference: Letter, T. Schneider to W. Taylor, "Comments – Transmittal of Responses to the Ohio Environmental Protection Agency Comments on the 2003 Site Environmental Report," dated October 26, 2004

Enclosed for your review and approval are responses to the Ohio Environmental Protection Agency (OEPA) comments on the 2003 Site Environmental Report Comment Response document. The United States Environmental Protection Agency (USEPA) indicated to the Department of Energy in the August 31, 2004 Weekly Conference Call that they would not be providing comments on this report.

If you have any questions or need further information, please contact Johnny Reising at (513) 648-3139.

Sincerely,

W Q Taylor

William J. Taylor
Director

FCP:Lojek

Enclosure: As Stated

cc w/enclosure:
D. Lojek, OH/FCP
J. Reising, OH/FCP
T. Schneider, OEPA-Dayton (three copies of enclosure)
M. Murphy, USEPA-V, AE-17J
G. Jablonowski, USEPA-V, SR-6J
M. Cullerton, Tetra Tech
F. Bell, ATSDR
M. Shupe, HSI GeoTrans
R. Vandegrift, ODH
AR Coordinator, Fluor Fernald, Inc./MS78

cc w/o enclosure:
R. Abitz, Fluor Fernald, Inc./MS64
K. Alkema, Fluor Fernald, Inc./MS01
K. Broberg, Fluor Fernald, Inc./MS52-5
J. Chiou, Fluor Fernald, Inc./MS64
E. Henry, Fluor Fernald, Inc./MS52-5
W. Hertel, Fluor Fernald, Inc./MS52-5
M. Jewett, Fluor Fernald, Inc./MS52-5
F. Johnston, Fluor Fernald, Inc./MS52-5
M. Kopp, Fluor Fernald, Inc./MS52-5
C. Murphy, Fluor Fernald, Inc./MS01
D. Nixon, Fluor Fernald, Inc./MS01
D. Powell, Fluor Fernald, Inc./MS64
C. Tabor, Fluor Fernald, Inc./MS12
K. Voisard, Fluor Fernald, Inc./MS12
R. White, Fluor Fernald, Inc./MS52-5
ECDC, Fluor Fernald, Inc./MS52-7

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RESPONSES TO
OHIO ENVIRONMENTAL PROTECTION AGENCY
COMMENTS ON THE
2003 SITE ENVIRONMENTAL REPORT
COMMENT RESPONSES

FERNALD CLOSURE PROJECT
FERNALD, OHIO

DECEMBER 2004

U.S. DEPARTMENT OF ENERGY

RESPONSES TO OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS ON THE 2003 SITE ENVIRONMENTAL REPORT COMMENT RESPONSES (51350-RP-0024, REVISION 0, FINAL)

ORIGINAL COMMENTS:

1. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-5 Line #: 32 Code: C
Original Comment #: 4

Comment: The common ion data are not proposed to be used directly for leak detection. The common ion data are proposed to assess groundwater aging beneath each waste cell and to assist in establishing an effective statistical protocol for leak detection analysis. Specifically, the objective of monitoring common ions in the HTWs (both pre- and post-baselines) is twofold. First, the results will serve as verification that "aging water" processes are truly active at the site and are a valid explanation for the observed trends in site constituent concentrations. Second, the observed trends in the common ions will assist in delineating when aging effects have dissipated and data collection for background characterization can proceed. The presence of the 11 suggested parameters (magnesium, manganese, potassium, iron, chloride, sulfate, phosphate, alkalinity, and pH) in OSDF fill materials does not preclude their use in the groundwater aging assessment. Similarly, the rate at which an ion's concentration is affected by groundwater aging and the ion's background concentration relative to its leachate concentration do not preclude its use to assess groundwater aging. What is important is that the ions are ubiquitous in background groundwater and are in significant concentrations before the given cell is constructed. The common ions satisfy both conditions. The data should be used to establish before-construction concentration levels. Given that the other leak detection information (flow rates, etc.) indicates that no leak is occurring, the common ion data would be used for assessment of any post-construction concentration trends and determination of final equilibrium concentrations. Once all parameters achieve stability, baseline statistical parameters for each leak detection constituent can then be estimated and control limits reliably calculated. The drawback to relying solely on uranium for aging assessment is that uranium concentrations in the leachate are significantly greater than background concentrations in the till. Consequently, although till uranium concentrations are certainly affected by aging, the possibility of a system leak complicates interpretation of the uranium data in the till.

Response: The initial constituent list for monitoring the various horizons of the OSDF system was established in the OSDF Groundwater/Leak Detection and Leachate Monitoring Plan and was based on rigorous evaluation and selection process. Most of the cations and anions identified above would have similar concentrations in background perched water and OSDF leachate, so they have not been sampled in the different horizons for OSDF cells. Additionally, most cells are far into the construction process, if not already completed. Therefore, the ability to establish baseline conditions for these cations and anions would not be possible. The primary constituents monitored in association with the cells (boron, total organic carbon, total organic halogens, sulfate, and total uranium) are sufficient for detecting system leaks, as they represent ions that have the greatest potential for significant concentration differences between perched water (horizontal till wells) and OSDF leachate. In the event of a leak, the perched water will contain only a very small component of leachate and the leachate would have to have much higher concentrations than the perched water to have a noticeable impact on perched water concentrations. Substantial concentration differences are required if there is to be any detection of leakage via ion monitoring in the perched water, as indicated by OEPA in Comment 2, "Should a leak occur, its flow rate will most likely be very small, certainly less than the rate used in the hypothetical scenario." Therefore, a very low flow rate indicates that ions with similar order-of-magnitude concentrations in horizontal till wells and leachate will not be useful for

monitoring. Specifically, a hypothetical one percent contribution of leachate to perched water cannot be detected unless the ion concentration in the leachate exceeds that in the perched water by at least an order of magnitude.

Action: No action required.

2. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-7 Line #: 1 Code: C
Original Comment #: 7

Comment: DOE notes in the comment response that flow information must always be factored into the overall leak detection evaluation process. The hypothetical leak simulation provided in the comment response indicates that a worst-case leakage rate will result in a very small impact to the downgradient GMA monitoring wells after 10 years. Although the LCS and LDS flow data are useful for assisting with overall interpretation in the short term, the bottom line critical measures for leak detection are the concentrations of leachate constituents in till and GMA groundwater down gradient from the OSDF. Should a leak occur, its flow rate will most likely be very small, certainly less than the rate used in the hypothetical scenario. However, a properly formulated, statistically appropriate data analysis strategy, such as control charts, will detect an active source, whatever its strength. Once DOE can demonstrate that the effects of groundwater aging have diminished and that statistically defensible baseline parameters have been determined for each monitored constituent, the control limits for each constituent must be revised and control charts (or a similarly rigorous statistical method) must then be the primary leak detection tool. In the interim period, when arbitrarily specified control limits are in use (such as 75 percent of the FRL), greater weight can be given to LCS and LDS flow data during leak detection data analysis. Over the long term, however, when the final statistical methodology is operational, the flow data significance becomes diminished as the time for activity of a potential leak increases. DOE's hypothetical scenario lasted only 10 years, a far shorter time with respect to the planned service life of the OSDF.

Response: Per OEPA's recommendation, in the interim until such a time that a properly formulated, statistically appropriate data analysis strategy can be established, DOE will use arbitrarily specified control limits (such as 75 percent of the FRL) in conjunction with flow data in leak detection evaluations. DOE will continue to review statistical methodologies/tools to be used in future leak detection evaluations. Additionally, DOE would like to meet with the OEPA and the EPA to discuss further refinements to the OSDF monitoring program.

DOE's modeling effort presented in the original comment responses to the 2003 Site Environmental Report was conducted to address the original comment that stated:

> "Fifteen percent of the control chart limits were exceeded in 2003. DOE minimizes the significance of the exceedances in the text discussions by suggesting that they are the result of groundwater aging or pre-existing contamination."

The modeling effort was conducted to show that DOE was not attempting to minimize the significance of the exceedances. More specifically through the modeling effort, it can be confirmed that concentration changes in the environment are not noticeably discernable even if the overall system was leaking at an unreasonably high rate continuously for 10 years. It is understood that the OSDF service life will be much longer than 10 years; however, this modeling effort was conducted to address the original comment and to indicate the overall complexities regarding leak detection evaluations. As shown by the modeling exercise, even if there was a continuous high-volume leak, the impact to the environment would be difficult to discern, and more importantly, would be negligible.

Action: No action required.

3. Commenting Organization: Ohio EPA Commenter: GeoTrans, Inc.
Section #: Attachment A.5 Pg #: A.5-9 Line #: 33 Code: C
Original Comment #: 17

Comment: The original comment indicated that a leak detection issue may exist for total organic halogens at Cell 1. DOE's response states that the current control limits are not appropriate because groundwater aging processes have interfered with the establishment of a stable baseline data set. The total organic halogen's analysis provides a cumulative concentration for all halogenated organic compounds, both those that are potentially naturally occurring (humic and fulvic acids) and those that originate from contamination. Groundwater aging could explain any increases seen in the natural compounds but not for compounds such as organic solvents, PCBs, etc. To enable correct interpretation of the TOX data, DOE should perform a follow-up VOC scan to verify the conclusion that the current control limits are inappropriate and that any upward TOX trends observed results from groundwater aging.

Response: The previous comment response should have been clearer regarding the inappropriateness of these control limits. The original comment #17 was:

> "A leak concern may exist (Cell 1, total organic halogens) based on the downward trend in the concentrations between the monitoring horizons. Concentrations decline from the LCS (maximum baseline is 0.635 mg/L) to the LDS (maximum baseline is 0.0971 mg/L) to the HTW (maximum baseline is 0.0124 mg/L), the HTW cusum shows an upward trend, and the standardized mean exceeds its control limit."

The original comment indicated that the HTW standardized mean exceeded its control limit; however, from review of Figure A.5.1-45 (TOX for HTW 12338) this does not appear to be the case. The Shewhart Control Limit for TOX at HTW 12338 is 0.03 mg/L. The six quarters of post-baseline monitoring data, included two detected results at 0.0096 mg/L and 0.0124 mg/L which are below the contract required detection limit of 0.025 mg/L, while the remainder of the results were non-detects below the control limit. Also, the cusum line shown in Figure A.5.1-45 is trending upward primarily due to the higher detection limit. The increase in detection limits were discussed to a degree on page A.5-18 of the 2003 Site Environmental Report:

> "Upon review of the current control charts, DOE now believes that such a high percentage of non-detects could lead to invalid control limits. The control charts and associated limits become driven by the detection limits and not by actual detected and measured concentrations. For example, refer to the control chart for total organic halogens at Cell 2 GMA-U 22200 (Figure A.5.1-50), which has less than 50 percent detected concentrations. In reviewing the figure, it appears that the increase in the CUSUM limit line is due to an increase in the laboratory detection limit not detected concentrations. Note that every attempt is made to maintain consistent detection limits; however, laboratory issues have at times accounted for inconsistencies."

The inappropriateness of the TOX control limits for the HTW (0.03 mg/L) is better explained by referencing the perched water TOX background concentration of 0.126 mg/L (95th percentile), which is higher than the established control limits. At this time, DOE would like to use arbitrarily specified limits (such as 75 percent of the FRL) as OEPA has suggested in the interim period. In the cases where a FRL does not exist for a constituent, then either OSDF Pre-Design or background concentrations should be used. Based on the information above, it is not thought that the VOC scan is necessary at this time. DOE will continue to evaluate the data as they become available.

Action: No action required.

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Section #: Attachment A.5 Pg #: A.5-5 Line #: 32 Code: C
Original Comment #: 4

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Section #: Attachment A.5 Pg #: A.5-7 Line #: 1 Code: C
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